1. INTRODUCTION

Southern California experiences the most severe smog in the United States. Extremely high concentrations of ozone and suspended particles result from the combination of emissions from the second largest urban area in the U.S. (after the northeast corridor), high mountains that contain air pollutants, and adverse meteorology which limit atmospheric dispersion. For example, prior to the implementation of emission reduction measures in the early 1950s, hourly averaged ozone concentrations approaching 0.70 ppm were reported in the South Coast Air Basin (SoCAB or Basin), and Stage III episodes (ozone exceeding 0.50 ppm) were relatively frequent events in the 1960s. As a result of three decades of progressively more stringent controls on emissions of reactive organic gases and oxides of nitrogen, the frequency and intensity of excessive ozone concentrations in the SoCAB have been significantly reduced (Davidson, 1993). Azusa, which is located in a main ozone-impacted receptor area of the Basin, recorded 221 days exceeding the National Ambient Air Quality Standard (NAAQS) of 0.12 ppm maximum hourly average in 1960, 190 days in 1970, 129 days in 1980 and 79 days in 1993 (SCAQMD, 1994). This progress has occurred despite a population increase of 84 percent between 1960 and 1990, and associated increases in commercial activities and vehicle miles traveled. Although air quality in the SoCAB has improved significantly, the state and national ozone standards continue to be exceeded frequently in this basin and in other air basins in southern California. Because the relatively easy and most cost effective emission controls have already been implemented in California, attainment of the ozone standards in southern California remains a long-term goal, and air pollution control agencies will face many difficult regulatory issues in the decade ahead.

Historically, the scientific and regulatory communities have learned a great deal about urban smog formation from air quality studies in southern California. The most comprehensive study in the SoCAB was the 1987 Southern California Air Quality Study (SCAQS) (Lawson, 1990). The SCAQS air quality, meteorological, and emission databases provided a rich source of information for understanding the ozone and suspended particle problems in the SoCAB. Similar studies were conducted in the San Diego area (Bigler-Engler and Brown, 1995; Hossain and Kaszuba, 1995), in the South Central Coast (Moore *et al.*, 1991), and in the San Joaquin Valley (Solomon and Silver, 1994). While much of the generally applicable and fundamental knowledge regarding emissions, air pollution meteorology, air pollution chemistry, and receptor concentrations of ozone and suspended particles has been derived from studies of the SoCAB, the complex meteorological and chemical processes taking place in the region under conditions in which high concentrations of ozone are formed above ground level and in which ozone is transported between air basins are still not completely understood.

1.1 Background and Issues

In November 1990, Congress enacted a series of amendments to the Clean Air Act (CAA) intended to intensify air pollution control efforts across the nation. One of the primary goals of the 1990 amendments was an overhaul of the planning provisions for those areas not currently meeting the National Ambient Air Quality Standard (NAAQS). The NAAQS for ozone is exceeded when the daily maximum hourly average concentration exceeds 0.12 ppm more than once per year on average during a three-year period. The California State standard is more stringent: no hourly average ozone concentration is to exceed 0.09 ppm. The CAA identifies specific emission reduction goals, requires both a demonstration of reasonable further progress and attainment, and incorporates more stringent sanctions for failure to attain the ozone NAAQS or to meet interim milestones.

The 1990 CAA set a new classification structure for ozone nonattainment areas. These classifications are marginal, moderate, serious, severe, and extreme. Each nonattainment area is assigned a statutory deadline for achieving the national ozone standard. Serious areas must attain the NAAQS by the end of 1999, severe areas by 2005 or 2007 (depending on their peak ozone concentrations), and extreme areas by 2010. The San Diego area is classified as serious, the Ventura and Southeast Desert areas are classified as severe, and the SoCAB is the only area in the country that is classified as extreme. The CAA prescribes minimum control measures for each ozone nonattainment area with more stringent controls required for greater degrees of nonattainment.

Emission reduction plans for ozone precursors in serious, severe, and extreme nonattainment areas were due and submitted to the U.S. Environmental Protection Agency (EPA) on November 15, 1994, as a revision to the California State Implementation Plan (SIP). Each ozone plan contains a current emissions inventory, plans for enhanced monitoring of ozone and ozone precursors, and estimation of future ozone concentrations based on photochemical modeling. To ensure a minimum rate of progress, each plan shows a 15 percent reduction in emissions of reactive organic gases (ROG) between 1990 and 1996, an additional 9 percent reduction in ROG by 1999, and 3 percent reductions per year thereafter, quantified at three year intervals to the attainment date.

At the state level, pollutant transport is now a recognized cause of air quality degradation. The California Clean Air Act of 1988 requires the California Air Resources Board (ARB) to assess the relative contributions of upwind pollutants to violations of the state ozone standard in downwind areas. The California Health and Safety Code, Division 26, paragraph 39610(b) states "The state board shall, in cooperation with the districts, assess the relative contribution of upwind emissions to downwind ozone ambient pollutant levels to the extent permitted by available data, and shall establish mitigation requirements commensurate with the level of contribution" (California Air Pollution Control Laws, 1992 edition, p. 14). Previous studies in California have demonstrated pollutant transport between air basins on specific days, but these studies have not quantified the contribution of transported pollutants to ozone violations in downwind areas.

The emission, meteorological, and atmospheric chemistry models, used to develop SIPs for the nonattainment areas on a national level and to quantify inter-basin transport on a state level, have several shortcomings in their representation of the physical and chemical processes involved in ozone formation due to the lack of field measurements to evaluate and refine their capabilities (NRC, 1991). In addition, the field measurements used for input to these models and to evaluate their validity do not adequately represent current emission rates, chemical composition, and air quality. The SCAQS was conducted almost nine years ago and the South Central Coast Air Basin (SCCAB) has not been extensively studied since the South Central Coast Cooperative Aerometric Monitoring Program (SCCCAMP) in 1984 and 1985. Since the SCAQS, there have been measurable changes in the air quality of the SoCAB based on analyses of the routinely available monitoring data (Fujita, 1992; Davidson, 1993). The 1997 Southern California Ozone Study (SCOS97) is intended to provide another milestone in the understanding of relationships between emissions, transport, and ozone standard exceedances, as well as to facilitate planning for further emission reductions needed to attain the NAAQS.

SCOS97 is being conducted under the Charter of the North American Research for Tropospheric Ozone (NARSTO). The NARSTO program is a public/private partnership, whose membership spans government, the utilities, industry, and academia throughout Mexico, the United States and Canada. Its primary mission is to coordinate and enhance policy-relevant scientific research and assessment of tropospheric ozone behavior and provide a cross-organization planning process for scientific investigations. SCOS97-NARSTO is the latest in series of large-scale field measurement programs addressing the urban ozone problem in North America.

Data collected in SCOS97 will be used to evaluate the ability of photochemical grid models to predict the change in ozone concentrations expected as a result of the change in emissions between 1987 and 1997. The feasibility of such a study was assessed by Stoeckenius *et al.* (1995). Ozone transport in southern California appears to be an important contributor to ozone exceedances, but these contributions have not been quantified. It was not previously possible to model the entirety of southern California owing to the limits of computational resources and the associated costs. More recently, computational power has increased while costs have declined, making regional modeling feasible. Another limitation has been the dearth of three-dimensional aerometric measurements to support regional modeling in the complex terrain of southern California. Recent developments in prognostic meteorological modeling combined with new measurement technologies (e.g., radar wind profilers, ozone lidars, NO_y analyzers) and recent enhancements in the aerometric network in southern California associated with the Photochemical Assessment Monitoring Stations (PAMS) have made it practical to perform modeling studies based on more cost-effective field programs than were previously conceived.

1.2 Goals and Technical Objectives of SCOS97-NARSTO

The goals of the study are to :

1. Update and improve the existing aerometric and emission databases and model applications for representing urban-scale ozone episodes in southern California, with a primary emphasis on high ozone concentrations in the South Coast Air Basin and secondary emphasis on high ozone concentrations in the San Diego Air Basin, the South Central Coast Air Basin, and the Southeast Desert Air Basin.

2. Quantify the contributions of ozone generated from emissions in one southern California air basin to federal and state ozone standard exceedances in neighboring air basins. Evaluate the interaction of transported ozone and ozone precursors, both at the surface and aloft, with emissions in neighboring receptor areas. Apply modeling and data analysis methods to design regional ozone attainment strategies.

These goals are to be met through a process which includes analysis of existing data; execution of a large-scale field study to acquire a comprehensive database to support modeling and analysis; analysis of the data collected during the field study; and the development, evaluation, and application of an air quality simulation model for southern California.

Specific technical objectives of SCOS97 are as follows:

1. Obtain a documented data set of specified precision, accuracy, and validity that supports modeling and data analysis efforts.

2. Document the frequency, intensity, and character of high ozone concentrations and its VOC and NO_X precursors within and between neighboring southern California air basins, and determine how these have changed over the past decade.

3. Identify and describe transport pathways between neighboring air basins, and estimate the fluxes of ozone and precursors transported at ground level and aloft under meteorological conditions associated with high ozone concentrations.

4. Quantify the uncertainty of emissions rates, chemical compositions, locations, and timing of ozone precursors that are estimated by emission models.

5. Quantify the uncertainty of meteorological models in simulating transport and mixing of precursors and end-products within and between air basins.

6. Quantify the uncertainty of air quality models in simulating atmospheric transformation and deposition.

7. Provide the meteorological and air quality measurements needed to estimate, with stated uncertainty intervals, the contributions from background, regional mixing and transport, and local emitters to ozone concentrations that exceed standards in each of the air basins.

8. Provide the meteorological and air quality measurements needed to estimate the effects of different emission reduction strategies on ozone concentrations within and beyond each air basin, and identify those that cause the greatest reduction in population exposure for the least cost.

1.3 Objectives of SCOS97-NARSTO Field Study Plan

As an integrated study, SCOS97 will characterize prevailing ambient air quality, meteorology, and emissions in southern California. It will develop, test, and apply complex models that establish source-receptor relationships and quantify interbasin transport. This modeling will be performed for the entire region and on major sub-regions by the ARB, the South Coast Air Quality Management District, the SDAPCD, the VCAPCD and others. This SCOS97 field study plan addresses only the ambient measurements needed to support this work for the summer of 1997. The specific objectives of this plan are as follows:

1. Review previously acquired data sets and the published documents to develop a conceptual model of important meteorological and chemical processes associated with elevated ozone levels in southern California, and to refine it as new information becomes available.

2. Define criteria for meteorological and air quality measurements and to identify methods that can meet these criteria.

3. Specify meteorological and air quality field measurements in terms of locations, variables measured, spatial and temporal averaging intervals, precision and accuracy, and measurement period.

4. Outline procedures to collect, archive, and evaluate the quality of available meteorological and air quality data, as well as data acquired during the study period.

5. Propose and test methods to accurately forecast the occurrence of high ozone concentrations associated with different transport pathways for commencing intensive operating periods during 1997.

6. Outline data analysis and modeling activities and the uses of the acquired data by these activities.

7. Estimate costs of different program components and evaluate trade-offs among these components to attain budget constraints.

8. Specify levels-of-effort, necessary monetary expenditures, and responsibilities of participating agencies and contracted investigators.

9. Outline a management and communications structure among project participants.

10. Identify schedules, milestones, and deliverables required to bring the project to successful completion.

The field study plan is an evolving document, and first draft in June 1996 provided a starting point rather than an end-product. A final plan will be issued by March, 1997 to incorporate all of the current information to carry out the field study during the summer of 1997. The field study plan will be accompanied by two other plans for emission modeling and for meteorological and air quality modeling.

The emission plan will describe how to:

1. Develop a spatially and temporally (including day-specific inventories for weekdays and weekends) resolved inventory of emission estimates of ROG, NO_X, and CO from anthropogenic sources.

2. Improve and extend the existing SoCAB biogenic ROG emission estimates to the rest of southern California, and develop estimates of NO_X emission from fertilized soils and ROG emissions from geogenic sources.

3. Develop, evaluate, and apply methods to propagate ROG, NO_X, and CO emission inventory uncertainties.

4. Project the effects of future activity and alternative controls on emission estimates.

5. Acquire, archive, and manage activity data from which emission estimates can be developed.

6. Estimate costs, schedules, and responsibilities for emission modeling activities.

The modeling plan will describe procedures to:

1. Evaluate and select existing modeling codes and recent innovations in computation methods to determine the optimal software and hardware platforms for meteorological and chemical simulation.

2. Specify model domain boundaries, grid sizes, layers, and surface characteristics.

3. Identify performance measures and performance evaluation methods, and specify methods by which these will be applied.

4. Estimate costs, schedules, and responsibilities for meteorological and air quality modeling activities.

1.4 Management Structure

SCOS97-NARSTO will be a large undertaking involving many contractors, sponsoring organizations and governmental agencies. In a cooperative study such as this, no one person can have direct management authority over all phases of the study. Since direct fiscal responsibility will remain with the California Air Resources Board (ARB), South Coast Air Quality Management District (SCAQMD), San Diego Air Pollution Control District (SDAPCD), Ventura County Air Pollution Control District (VCAPCD), Mohave Desert Air Quality Management District (MDAQMD), United States Navy, Coordinating Research Council (CRC), the management structure for SCOS97 reflects this consortium of sponsors.

The management structure will require at least the following elements.

- SCOS97 Technical Committee. Through consensus, this group sets the goals of the study and makes decisions regarding general study objectives, funding, and selection of contractors. The TC is made up of technical staff members from ARB (Research and Technical Support Divisions), SCAQMD, SDAPCD, VCAPCD, Santa Barbara APCD, MDAQMD, EPA-Region IX, and United States Navy. The Technical Committee will also include other sponsoring organizations. The TC directs the planning efforts and coordinates the technical activities of the contractors to ensure that the measurement, emission, modeling, and analysis activities are coordinated with each other and focused on the study objectives. It does most of the work of writing requests for proposals and evaluating proposals. It reviews the input of the planning, management, and technical contractors and makes recommendations to the management of their respective organizations regarding objectives, funding issues, and contractor selection. The members of this group work closely with the program management team and are involved in or approve most significant technical decisions. Individual members serve as liaison between the sponsors and the contractors and have day-to-day responsibility for such things as overseeing the contractors, approving invoices, and making contractual and management decisions. The membership of the TC is listed in Appendix C.

- Field Program Management Committee. The FPMC will provide the day-to-day technical management during the field study. The FPMC makes decisions regarding intensive operation periods, and contingency funding. This committee includes a single representative from the ARB Research Division (Bart Croes), ARB Technical Support Division (Don McNerny), SCAQMD (Henry Hogo), SDAPCD (Judy Lake - Chair), VCAPCD (Doug Tubbs), U.S. EPA (Carol Bohnenkamp), U.S. Navy (Jay Rosenthal).

- Forecast Team. The forecast team develops the Forecast Plan in conjunction with the field manager, reviews meteorological data, and provides consensus forecasts to the FPMC. The forecast team also documents the daily meteorological conditions during 1997. This team includes a single representative from the ARB (Steve Gouze), SCAQMD (Joe Cassmassi – Chair), SDAPCD (Virginia Bigler-Engler), VCAPCD (Kent Field), and U.S. Navy (Jay Rosenthal).

- Field Managers. The FMs coordinate the activities of the field contractors (in-kind personnel will be under the direction of their management/FPMC members). Jim Pederson (upper-air meteorology), Leon Dolislager (air quality), Dr. Ash Lashgari (surface meteorology, ozone and NOy) and Dr. Randy Pasek (VOC) of the Air Resources Board Research Division will be the FMs and the main contact points to relay information on measurement readiness status during and between the intensive operational periods (IOPs).

- Quality Assurance Manager. The QA manager is responsible for developing the QA plan in conjunction with the field managers and field contractors. The QA manager manages the systems and performance audits and reports their results to the field manager and field contractors. The QA manager works with the data manager to develop quality assurance data screening protocols and manages the data quality assurance efforts. Dr. Eric Fujita of the Desert Research Institute will be the QA manager and will report to the SCOS97 Technical Committee.

- Data Manager. The data manager is responsible for developing the data management plan in conjunction with the field managers and field contractors. The data manager works with the field manager, measurement contractors, modelers, and analysts to develop standard data formats for use in the study. The data manager is responsible for obtaining project data and supplemental data, integrating the data into a common database, performing Level 1 screening of the data, providing the data to the QA, analysis, and modeling contractors, and documenting and maintaining the data archive. Richard Hackney of the Air Resources Board Technical Support Division will be the data manager.

1.5 Planning Process

In 1993, several air quality management districts in southern California proposed to sponsor the SCOS97 field study to address interbasin transport. In July 1994, the South Coast Air Quality Management District (SCAQMD) hosted an initial planning meeting. The meeting was attended by other districts (Mojave Desert, Santa Barbara County, San Diego, and Ventura County), EPA-Region IX, utilities (Pacific Gas & Electric and Southern California Gas Company), oil companies (Atlantic Richfield Company, Chevron, Texaco and Unocal), industrial research consortiums (Coordinating Research Council and Electric Power Research Institute), and representatives of academia. A technical committee and three working groups (meteorology, air quality, and emission inventory) were formed to define goals and technical objectives for the proposed study and to provide coordination among sponsoring organizations. Memberships of the working groups are listed in Appendix C. A conceptual plan was completed by the working groups and approved by the technical committee in November, 1995. This conceptual plan proposed the study goals and deliverables, the technical objectives, measurement requirements, data analysis activities, and modeling approaches.

The SCOS97 conceptual plan (ARB, 1995a) provided the basis for the June 1996 draft of the field study plan (Fujita et al., 1996). The draft field study plan matched the SCOS97 goals and objectives with the resources available to do the job, and specified the details of the field study plan that would allow the conceptual plan to be executed. The field study plan summarizes existing information on emissions, summer ozone climatology, and current air quality, and it provides a conceptual model for the ozone episodes and transport scenarios of interest. It specifies a measurement program to meet data requirements for data analysis and modeling. It also describes the required quality assurance, data validation, and data management needs. This version of the field study and quality assurance plan reflects the final stages of the planning process for the SCOS97-NARSTO Field Study.

The overall design process is iterative and the final plan will incorporate the input from sponsors, other stakeholders, knowledgeable peer reviewers, and users of the data. The following are some of the planning considerations that have been found to be important in past studies (Blumenthal and Watson, 1991; Lawson et al., 1993) that guided the planning of SCOS97-NARSTO.

- Begin planning at least two years before the field program, and allow at least one year for incorporation of the results of pilot studies into the full program plan. Allow sufficient time for pre-field study activities (e.g., time required for the contracting process and lead time for the acquisition of expendables and for siting). Contracts should be in place for such activities as siting and QA long before the start of the field effort. There must be adequate time to develop plans or select sites, review the choices, and then modify them if necessary.

- Include all stakeholders and users of the data in the design and execution of the study. The uses of the data should be clearly defined during the planning stage, and the modelers and analysts who will use the data should be involved in the planning process. Changes in the study design should be evaluated in terms of their effects on the modeling and analysis tasks. To assist in the overall planning phase, form several working groups (Meteorology, Emissions, Air Quality, and Modeling) to establish sampling protocols, and identify data needs for subsequent data analysis and modeling. Document results of the planning process in writing.

- Design the planning process to accommodate parallel planning and mid-course corrections. An initial scoping plan is required by sponsors so they can estimate the funding that will be needed. This step involves identifying the source(s) of funds for the study and the general level of funding available. Once the general funding level is identified, it is often necessary to revise the objectives and the scope to fit within the funding constraints. The elements of the plan and the design of the elements subsequently evolve throughout the planning process. It is important to build the capability for mid-course corrections into the planning process. Develop strawman plans early, and allow for changes and tradeoffs later. Identify design questions requiring additional information. If necessary, and if sufficient time is available, design and perform small pilot studies to answer the design questions. Maintain continuity between planning and management. Once the study plans are completed, they must be implemented by the sponsors. Proposal requests must be written and contractors selected. During the process of selecting contractors and implementing the study plan, many decisions and tradeoffs must be made. During this process, it is important to maintain continuity of the planning team in the management and decision process. In this way, the decisions made to change one element of the study will reflect an understanding of the study priorities and of how that change will affect other elements. Have a contingency plan for the field sampling program if meteorological conditions are not conducive for pollutant episode conditions.

- Before completing the plans, have the plans reviewed by a broad cross-section of interested and knowledgeable people. Modelers, analysts, potential measurement contractors, sponsors, and other knowledgeable scientists should be included in the review. One possible mechanism to accomplish the review is to convene a workshop. In addition, the costs of each component should be estimated and the plan reviewed in light of any funding limitations. Solicit evaluations by reviewers as to whether the plan will meet the objectives, whether the measurements are feasible and meet the needs of the modelers and analysts, whether the hardware and people resources are available in the required time frame, and whether the cost estimates are reasonable. Solicit suggestions for improvement. If changes are suggested which increase the cost, ask for suggestions to compensate for the changes to balance the budget. Assess the comments and recommendations in terms of the priorities and objectives, and revise the draft operational plan to reflect the changes due to budget and priority considerations as well as the input from the reviewers. After the resources and program objectives are reconciled, this information is compiled into the program (operational) plan.

- Integrate quality assurance (QA) into the planning process. The QA team should be chosen early and should be an integral part of the planning process. Allow enough funds to perform this task properly. Typically, about 5-10 percent of the total field and data processing budget is allocated to field QA, and additional QA resources are often provided directly by sponsoring agencies. Both quality control and quality assurance efforts for all program participants must be fully evaluated. Perform round-robin interlaboratory and intermethod comparisons before the field program begins. Build redundancy into all critical measurements. Use spectroscopic methods as "reference" methods where possible. In addition to lidar, there are several measurement methods for which accuracy and validity cannot be fully assessed through standard quality auditing procedures. These measurements include hydrocarbon speciation, carbonyl compounds, PAN, NO_y, and upper air meteorology. For these measurements, measurement comparisons are an acceptable means for estimating accuracy and validity. Section 8 describes the quality assurance issues related to these measurements and potential approaches for assessing data quality. The appropriate measurement comparisons and evaluations should be conducted well in advance of the SCOS97 field study, and coordinated through the quality assurance manager.

- Emphasize data archival as an integral part of the overall study. Data reporting conventions, site documentation, and units need to be established prior to delivery of data by the study participants. Funding and planning this activity up front (something that has not occurred in most studies) will greatly facilitate subsequent data analysis and modeling efforts. Recognize the need for extensive data management and “Level 2” data validation. The amount of effort required to get a database to a point where the validity of the numbers is understood is often greatly underestimated. Collecting data from many contractors into a single database is a tremendous task. To be reasonably confident in the data, temporal and spatial consistency checks (Level 2 validation) are useful. Aircraft and ground data and other collocated measurements should be compared. Screening tests should be performed to identify outliers and other inconsistencies (i.e., dew point higher than temperature, etc.). Analysts should quickly review the data to identify potential problems so that they can be resolved while the measurement personnel are still accessible.

- Provide sufficient funding for at least three types of data analysis: observation-based analyses; receptor modeling approaches; and airshed modeling. Provide for data to adequately evaluate the accuracy of emission inventory estimates and the performance of air quality models.

- Schedule symposia and workshops at appropriate intervals for presentation and discussion of data and results. Publish the results in peer-reviewed journals. Prepare a single volume that summarizes the study results. Allow several years for study results to be incorporated into policy. Five years elapsed between field measurements during the Southern California Air Quality Study (SCAQS) and formal presentation of data and modeling results.

Scientific papers are still being published nearly 10 years after the field study. Shorter or legislatively mandated timelines must rely on interim results that are subject to revision.

1.6 SCOS97-NARSTO Schedule and Milestones

The schedule for SCOS97 is outlined in Table 1-1. The overall time scale shown is five years. To meet this schedule, however, will require careful planning, fast turn-around by the sponsors on requests for proposals and contracts, and much front-end work by the Technical Committee. In the early stages of the program, several tasks must be performed in parallel, and the technical committee and working groups must meet frequently and coordinate closely.

1.7 Guide to Field Study Plan

This introductory section has provided a background for the proposed study and has specified the goals and technical objectives. Section 2 presents a “conceptual model” of the ozone episodes and transport scenarios of interest which serves as the basis for the experimental design of SCOS97. Section 3 provides an overview of the SCOS97-NARSTO field study and the existing meteorological and air quality measurement networks and supplemental measurements during the field study. Section 4 through 7 provide the specifications for measurement of surface air quality and meteorology, aloft air quality, aloft meteorology, and volatile organic compounds, respectively. Sections 8 and 9 describe the quality assurance and data management activities of the study, respectively. Development of the SCOS97-NARSTO emissions inventory is described in Section 10. Section 11 describes the data analysis and modeling tasks associated with the study. Section 12 provides an estimate of the costs for SCOS97 by program elements, and Section 13 includes a list of references cited in this document.

Table 1-1
Schedule of Major Milestones for the SCOS97

Due Date	Major Milestone
July 1994	Hold initial planning meeting for SCOS97.
January 1995	Feasibility study for a Southern California Air Quality Monitoring Study. Report prepared by Systems Application International for the Coordinating Research Council.
May-October 1995	Pilot studies (Barstow saturation monitoring, ozone aloft monitoring, and scanning lidar evalutions.
November 1995	Conceptual plan for SCOS97-NARSTO prepared by the Technical Committee and Working Groups.
June 1996	Draft SCOS97 Field Study Plan prepared by the Desert Research Institute with input from SCOS97-NARSTO TC and WGs.
August 1996	Preliminary regional meteorological modeling due.
October 1996	SCOS97 sponsors release requests for proposals.
December 1996 to March 1997	Contracts in place.
April 1997	Draft SCOS97 Quality Assurance Plan prepared by the Desert Research Institute with input from SCOS97-NARSTO TC, WGs, and measurement contractors.
June 1997	Final SCOS97-NARSTO Field Study and Quality Assurance Plan prepared by Desert Research Institute with input from SCOS97-NARSTO TC, WG, and measurement contrators.
June 15, 1997 to October 15, 1997	Conduct SCOS97-NARSTO field study.
June 1998	Complete assembly and validation of data archive.
1998	SCOS97-NARSTO symposium I - Review of field study and preliminary interpretation of data.
March 1999	Complete data analysis.
June 1999	Regional meteorological modeling evaluation and emission inventory due.
1999	SCOS97-NARSTO symposium II - Data Analysis
January 2000	Regional air quality model evaluation due.
June 2000	Regional control strategy assessment due.